CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

TENTATIVE MONITORING AND REPORTING PROGRAM NO. R9-2004-0111
FOR

SWEETWATER AUTHORITY
LOWER SWEETWATER RIVER BASIN
GROUNDWATER DEMINERALIZATION PLANT

SAN DIEGO COUNTY

A. MONITORING PROVISIONS

1. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in Order No. R9-2004-0111 or in this monitoring and reporting program and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of this Regional Board.

2. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to ensure that the accuracy of the measurements are consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ±10 percent from true discharge rates throughout the range of expected discharge volumes. Guidance in selection, installation, calibration and operation of acceptable flow measurement devices can be obtained from the following references:

   a. "A Guide to Methods and Standards for the Measurement of Water Flow," U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 421, May 1975, 96 pp. (Available from the U.S. Government Printing Office, Washington, D.C. 20402. Order by SD Catalog No. C13.10:421.)

   b. "Water Measurement Manual," U.S. Department of Interior, Bureau of Reclamation, Second Edition, Revised Reprint, 1974, 327 pp. (Available from the U.S. Government Printing Office, Washington D.C. 20402. Order by Catalog No. 172.19/2:W29/2, Stock No. S/N 24003-0027.)

   c. "Flow Measurement in Open Channels and Closed Conduits," U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 484, October 1977, 982 pp. (Available in paper copy or microfiche from National Technical

Information Services (NTIS) Springfield, VA 22151. Order by NTIS No. PB-273 535/5ST.)

d. "NPDES Compliance Sampling Manual," U.S. Environmental Protection Agency, Office of Water Enforcement, Publication MCD-51, 1977, 140 pp. (Available from the General Services Administration (8FFS), Centralized Mailing Lists Services, Building 41, Denver Federal Center, CO 80225.)

3. Monitoring must be conducted according to United States Environmental Protection Agency (USEPA) test procedures approved under Title 40, United States Code of Federal Regulations (CFR), Part 136, *Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act* as amended, unless other test procedures are specified in Order No. R9-2004-0111 and/or in this Monitoring and Reporting Program and/or by this Regional Board.

4. Monitoring results must be reported on forms approved by this Regional Board. Duplicate copies of the monitoring reports signed and certified as required by Reporting Requirement F.12 of Order No. R9-2004-0111 must be submitted to the USEPA and the Regional Board at the addresses listed in Reporting Requirement F.14 of Order No. R9-2004-0111.

5. If the discharger monitors any pollutant more frequently than required by Order No. R9-2004-0111 or by this monitoring and reporting program, using test procedures approved under 40 CFR Part 136, or as specified in Order No. R9-2004-0111 or this Monitoring and Reporting Program or by this Regional Board, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the discharger's monitoring report. The increased frequency of monitoring shall also be reported.

6. The discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by Order No. R9-2004-0111 and this monitoring and reporting program, and records of all data used to complete the application for Order No. R9-2004-0111, for a period of at least five years from the date of the sample, measurement, report, or application. This period may be extended by request of this Regional Board at any time.

7. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in Order No. R9-2004-0111 or this Monitoring and Reporting Program.

8. All analyses shall be performed in a laboratory certified to perform such analyses by the California Department of Health Services or a laboratory approved by this Regional Board.

9. The discharger shall report all instances of noncompliance not reported under Reporting Requirement F.5 of Order No. R9-2004-0111 at the time monitoring reports are submitted. The reports shall contain the information listed in Reporting Requirement F.5.

10. Records of monitoring information shall include:

    a. The date, exact place, and time of sampling or measurements;
    b. The individual(s) who performed the sampling or measurements;
    c. The date(s) analyses were performed;
    d. The individual(s) who performed the analyses;
    e. The analytical techniques or methods used; and
    f. The results of such analyses.

11. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

12. Monitoring results shall be reported at intervals and in a manner specified in Order No. R9-2004-0111 or in this Monitoring and Reporting Program.

13. This monitoring program may be modified by this Regional Board, as appropriate.

B. EFFLUENT MONITORING

1. Effluent monitoring for brine concentrate shall be conducted at the discharge point to the Upper Paradise Creek Flood Control Channel, outfall 009, and shall be conducted as noted in *Table 1. Effluent Monitoring Requirements for Reverse Osmosis Brine Concentrate Discharge.*

Table 1. Effluent Monitoring Requirements for Reverse Osmosis Brine Concentrate Discharge.

Constituent	Units	Effluent Limitation	Sample type	Analysis Frequency	Reporting Frequency
Flowrate	mgd	--	--	Daily	Quarterly
Salinity	ppt	--	Grab	Monthly	Quarterly
pH	units	Within the limits of 6.0 and 9.0 at all times	Grab	Monthly	Quarterly
Settleable solids	ml/L	--	Grab	Monthly	Quarterly
Total suspended solids	mg/L	--	Grab	Monthly	Quarterly
Nitrate (as N)	mg/L	5.0	Grab	Monthly	Quarterly
Total phosphorus	mg/L	--	Grab	Monthly	Quarterly
Orthophosporous	mg/L	--	Grab	Monthly	Quarterly

Constituent	Units	Effluent Limitation	Sample type	Analysis Frequency	Reporting Frequency
Copper	µg/L	3.73	Composite	Quarterly	Quarterly
Arsenic	µg/L	--	Composite	Quarterly	Quarterly
Zinc	µg/L	--	Composite	Quarterly	Quarterly
Selenium	µg/L	--	Composite	Quarterly	Quarterly

Note: mgd = million gallons per day ppt = parts per thousand ml/L = milliliters per liter
mg/L = milligrams per liter µg/l = micrograms per liter

2. Effluent monitoring shall be conducted at the respective discharge points for the discharges of groundwater well-purge water and pressure (air) relief valves as noted in *Table 2. Effluent Monitoring Requirements for Groundwater Well-purge Water, Pressure (Air) Relief Valves, and Plant Feed-water Dump.*

Table 2. Effluent Monitoring Requirements for Groundwater Well-purge Water, Pressure (Air) Relief Valves, and Plant Feed-water Dump.

Constituent	Units	Effluent Limitation	Sample type	Analysis Frequency	Reporting Frequency
Flowrate	mgd	--	--	**	Quarterly
pH	units	Within the limits of 6.0 and 9.0 at all times	Grab	**	Quarterly
Duration of discharge	minutes	--	--	**	Quarterly
Date of discharge	mm/dd/yy	--	--	**	Quarterly
Copper	µg/L	--	Grab	Quarterly	Quarterly
Arsenic	µg/L	--	Grab	Quarterly	Quarterly
Zinc	µg/L	--	Grab	Quarterly	Quarterly
Selenium	µg/L	--	Grab	Quarterly	Quarterly

** Whenever the discharge occurs.

3. Each groundwater well discharge location shall be qualitatively evaluated each quarter and reported quarterly. The qualitative evaluation shall include a narrative description of any erosion, sediment deposition, or other impacts to vegetation or wildlife in the vicinity of the respective discharge.

4. Effluent monitoring shall be conducted at the respective discharge points for the discharges of chlorine contact-tank overflow and shall be conducted as noted in *Table 3. Effluent Monitoring Requirements for Chlorine Contact-tank Overflow.*

Table 3. Effluent Monitoring Requirements for Chlorine Contact-tank Overflow.

Constituent	Units	Effluent Limitation	Sample type	Analysis Frequency	Reporting Frequency
Flowrate	mgd	--	--	**	Quarterly
Chlorine Residual	mg/L	0	Grab	**	Quarterly
pH	units	Within the limits of 6.0 and 9.0 at all times	Grab	**	Quarterly
Duration of discharge	minutes	--	--	**	Quarterly
Date of discharge	mm/dd/yy	--	--	**	Quarterly
Copper	µg/L	--	Grab	Quarterly	Quarterly
Arsenic	µg/L	--	Grab	Quarterly	Quarterly
Zinc	µg/L	--	Grab	Quarterly	Quarterly
Selenium	µg/L	--	Grab	Quarterly	Quarterly

** Whenever the discharge occurs.

C. RECEIVING WATER MONITORING

The discharger shall implement, as necessary, the monitoring and reporting program in *Section 3, Downstream Monitoring*, and *Section 5, Summary of Monitoring Program in Demineralization Facility Production Adjustment* of the *Lower Sweetwater River Basin Groundwater Demineralization Project, Mitigation and Monitoring Program*, (MMP) prepared by Sweetwater Authority and U.S.D.I. Bureau of Reclamation, May 16, 1997, as revised through July 1998. See *Attachment A, Lower Sweetwater River Basin Groundwater Demineralization Project, Mitigation and Monitoring Program*, prepared by the Sweetwater Authority and U.S.D.I. Bureau of Reclamation, May 16, 1997 as revised through July 1998.

a. The discharger shall evaluate the data collected pursuant to the MMP in an expedient manner after each sampling event and report quarterly to the Regional Board the results of such an evaluation.

b. Indications that the discharge has caused an exceedence of the threshold limits for nitrates or impacts to downstream beneficial uses shall be reported as specified in *Provision E.2.* of *Order No. R9-2004-0111.*

c. The MMP shall include one (1) water quality sampling point within 50 meters upstream of the discharge point in the Upper Paradise Creek Flood Control Channel. If this sampling point does not have a flow during the sampling period, the discharger shall state so in the monitoring report data.

d. The MMP monitoring shall include the following water quality constituents:
   (1) Total Dissolved Solids (salinity),
   (2) Total Kjeldahl Nitrogen (TKN),
   (3) Nitrate (as N),
   (4) Chlorophyll A (μg/l),
   (5) Total Phosphorus (mg/l), and
   (6) Orthophosphate (mg/l).

D. ANNUAL SUMMARY REPORT

The discharger shall submit an annual tabular and graphical summary of the data collect for this monitoring program including the MMP.

E. MONITORING AND REPORTING SCHEDULE

Monitoring reports shall be submitted to this Regional Board according to the dates in *Table 4. Monitoring and Reporting Schedule.*

Table 4. Monitoring and Reporting Schedule.

Reporting Frequency	Report Period	Report Due
Quarterly	January through March	May 1
Quarterly	April through June	August 1
Quarterly	July through September	November 1
Quarterly	October through December	February 1
Annually	January through December	February 1

F. ENDNOTE REFERENCES

1. A grab sample is defined as an individual sample of at least 100 milliliters collected over a period not exceeding 15 minutes. Grab samples shall be collected over a shorter period if necessary to ensure that the constituent/parameter concentration in the sample is the same as that at the sampling location at the time the sample is collected.

2. A composite sample is defined as a combination of at least eight sample aliquots of at least 100 milliliters, collected at periodic intervals during the operating hours of a facility over a 24-hour period. For volatile pollutants, aliquots must be combined in the laboratory immediately before analysis. The composite must be flow proportional; either the time interval between each aliquot or the volume of each aliquot must be proportional to either the stream flow at the time of sampling or the total stream flow since the collection of the previous aliquot. Aliquots may be collected manually or automatically.

Ordered by _____tentative_____
JOHN H. ROBERTUS
Executive Officer

Date: June 9, 2004

Lower Sweetwater River Basin
Groundwater Demineralization Project

MITIGATION AND MONITORING PROGRAM

Prepared by

Sweetwater Authority
505 Garrett Avenue
Chula Vista, CA 91910

and
U.S.D.I. Bureau of Reclamation
Boulder City, Nevada

May 16, 1997
Revised July 7, 1997
Ongoing Updates:
October 1997
February 1998
April 1998
July 1998

ATTACHMENT A
MRP No. R9-2004-0111

DISTRIBUTION OF
MITIGATION AND MONITORING NOTEBOOK

Agencies:

Ms. Mary Webb, U.S. Department of the Interior, U.S. Bureau of Reclamation, Lower Colorado Branch, Room M-116, Code: LC-2223, P.O. Box 61470, Boulder City, NV 89006-1470
Mr. John Hanlon, U.S. Department of the Interior, U.S. Fish and Wildlife Service, 2730 West Loker Avenue, Carlsbad, CA 92008
Mr. Bob Hoffman, National Marine Fisheries Service - Southwest Region, 501 West Ocean Boulevard, Suite 4200, Long Beach, CA 90802-4221
Mr. John Robertus, Regional Water Quality Control Board, 9771 Clairemont Mesa Boulevard, Suite B, San Diego, CA 92124-1331
Mr. Greg Walls, California Department of Fish and Game, 530 East Montecito, Room 104, Santa Barbara, CA 93103

Project Team:

Mr. Jim Smyth, Chief Engineer, Sweetwater Authority, P.O. Box 2328, Chula Vista, CA 91912-2328
Mr. Hector Martinez, Project Manager, Sweetwater Authority, P.O. Box 2328, Chula Vista, CA 91912-2328
Mr. Dennis Bostad, Director of Water Quality, Sweetwater Authority, 100 Lakeview Avenue, Spring Valley, CA 91977
Mr. Pete Baranov, Chemist, Sweetwater Authority, 100 Lakeview Avenue, Spring Valley, CA 91977
Mr. Pete Famolaro, Principal Biologist, Sweetwater Authority, 100 Lakeview Avenue, Spring Valley, CA 91977
Mr. Kevin Kasner, Sweetwater Authority, P.O. Box 2328, Chula Vista, CA 91912-2328
Ms. Troy Murphree, Senior Environmental Coordinator, Sweetwater Authority, P.O. Box 2328, Chula Vista, CA 91912-2328
Ms. Barbara Bartholomae, Boyle Engineering, 7807 Convoy Court, San Diego, CA 92111
Mr. Keith Merkel, Merkel and Associates, 4455 Murphy Canyon Road, Suite 120, San Diego, CA 92123 (w/o attachment)
Dr. Michael Busdosh, Affinis, 847 Jamacha Road, El Cajon, CA 92019 (w/o attachment)

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Table of Contents

Section			Page
1.0	**Summary**		1
2.0	**Upstream Monitoring**		5
	2.1	Alluvial Groundwater Levels and Water Quality	5
	2.2	Soil Moisture	9
	2.3	Borings	12
	2.4	Stream Gages	13
	2.5	Vegetation Monitoring	15
3.0	**Downstream Monitoring**		19
	3.1	Water Sampling	19
	3.2	Eelgrass	23
	3.3	Macroalgae	26
	3.4	Seasonal Nitrogen Mass Loading Model	29
4.0	**Other Monitoring**		32
	4.1	San Diego Formation Wells	32
	4.2	Land Use and Development Monitoring	35
	4.3	URDS I/II Discharge Monitoring	38
	4.4	Light-footed clapper rail	40
	4.5	KOA TDS Monitoring	42
	4.6	Rainfall Data	44
	4.7	DHS Vulnerability Assessment Requirements	45
5.0	**Summary of Monitoring and Production Adjustments**		47
	5.1	Objective	47
	5.2	General	47
	5.3	Monitoring Impact Analysis	48
	5.4	Time Frame	48
	5.5	Responsibility	48
6.0	**Reporting to Resource Agencies**		51
	6.1	U.S. Fish and Wildlife/State Fish and Game	51
	6.2	Regional Water Quality Control Board	51
	6.3	All Involved Agencies	51

Figures

1-1	Proposed Production Wells	2
1-2	Monitoring Elements	3
2-1	Groundwater Elevations vs. Alluvial Well Production	8
2-2	Soil Moisture vs. Alluvial Well Production	11
2-3	Viewpoints of Photos and Limits of Aerial Photos	16
3-1	Downstream Monitoring Locations	20

Table of Contents (continued)

Figures (continued)

3-2	Distribution of Eelgrass Beds	24
3-3	Summary of Macroalgae Findings	28
3-4	Demineralization Facility Plant Volume Balance	30
4-1	Area of Land Use Monitoring	36
5-1	Upstream Impact Analysis	49
5-2	Downstream Impact Analysis	50

Tables

1-1	Monitoring Program Summary	4
2-1	Alluvial Groundwater Elevations	6
2-2	Alluvial Groundwater Quality Analysis	7
2-3	Soil Moisture Percentage versus Alluvial Well Production	10
2-4	Stream Gage Flows	14
2-5	Vegetation Monitoring	17
3-1	Sampling Dates and Tides	21
3-2	Downstream Surface Water Samples	22
3-3	Summary of Eelgrass Distribution	25
3-4	Summary of Macroalgae Findings	27
3-5	Report of Nitrogen Mass Loading Model	31
4-1	Summary of Groundwater Depths, SDF Monitoring Wells	33
4-2	Summary of Water Samples, SDF Monitoring Wells	34
4-3	Land Use and Construction Monitoring	37
4-4	Summary of URDS I/II Discharges	39
4-5	Summary of Light-footed Clapper Rail Surveys	41
4-6	KOA TDS Monitoring	43
4-7	Summary of Rainfall	46

Appendices

A Soil Boring Report
B County of San Diego Stream Gage Agreement
C Analytical Method for Measuring TDS
D Analytical Method for Measuring TKN
E Analytical Method for Measuring Nitrate
F Analytical Method for Measuring Chlorophyl A
G Biological Surveys and Reports
- G-1 Vegetation Surveys
- G-2 Eelgrass and Macroalgae Surveys
- G-3 Light-footed Clapper Rail Surveys

H Soil Moisture Data
I DHS Vulnerability Assessment Requirements

Section 3
Downstream Monitoring

3.1 Water Sampling

A. Task. Water samples will be collected from five locations in the Lower Sweetwater River upstream and downstream of the demineralization plant discharge point. These locations are shown on **Figures 3-1.** Water samples will consist of the following chemical analyses: (1) total dissolved solids, (2) total Kjeldahl nitrogen (TKN), (3) nitrates, and (4) chlorophyl A levels as a measure of phytoplankton.

B. Purpose. Provide chemical analysis of lower Sweetwater River to determine effect by the concentrate disposal.

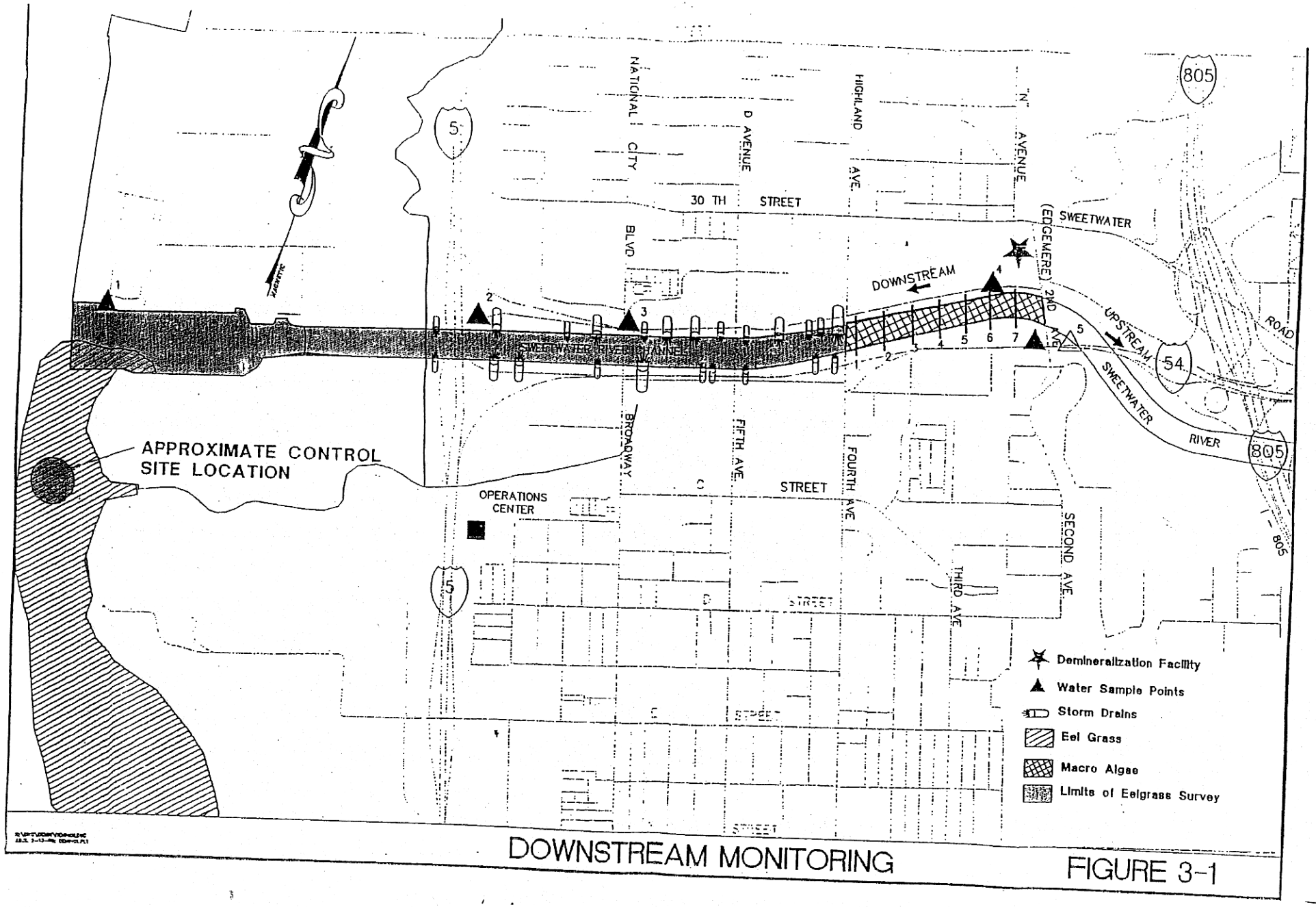
C. Time Frame. Samples shall be taken at or near low ebb tidal stage near a perigeon (spring) tide series, continuing for three years. At that time, all involved parties will meet to determine whether additional monitoring and/or revisions to the monitoring program will be required. Additional samples may be taken during the first seasonal storm to account for golf course and street surface runoff.

D. Methodology. Procedures for sample collection and analysis using American Water Works Association (AWWA) standards will be followed. Specific analyses are as follows:

1. Total dissolved solids (TDS)/Salinity. See Appendix C.
2. Total Kjeldahl Nitrogen (TKN). See Appendix D.
3. Nitrate. See Appendix E.
4. Chlorophyl A. See Appendix F.
5. Total Phosphorus (added to monitoring November 1997 by SWA staff).

Summary of sampling dates is shown in **Table 3-1, with sampling data shown in Table 3-2.**

E. Staff Responsible. Water Quality Department (P. Baranov).



DOWNSTREAM MONITORING

FIGURE 3-1

SAMPLING DATES AND TIDES

TABLE 3-1

MONTH	DAY	DAY OF WEEK	YEAR	TIME	TIDE HEIGHT (FT.)	LOWEST TIDE	HEIGHT AT LOWEST TIDE (FT.)
January	26	Monday	1998	1437	-1.2	1/28/98 @1513	-1.5
February	25	Wednesday	1998	1446	-1.4	1/25/98 @ 1446	-1.4
March	25	Wednesday	1998	1337	-0.9	1/26/98 @ 1414	-1
April	22	Wednesday	1998	1318	-0.3	4/27/98 @ 0452	-1.5
May	18	Monday	1998	0945	0.1	5/26/98 @ 0444	-1.7
June	15	Monday	1998	0808	-0.2	6/24/98 @ 0435	-1.6
July	14	Tuesday	1998	0735	0.0	7/22/98 @ 0341	-1.2
August	12	Wednesday	1998	0701	0.5	8/8/98 @ 0429	-0.9
September	17	Thursday	1998	1419	1.5	9/5/98 @ 0323	-0.7
October	15	Thursday	1998	1308	0.1	9/7/98 @ 0524	-0.7
November	03	Tuesday	1998	1440	-1.1	11/5/98 @ 1615	-1.4
December	02	Wednesday	1998	1434	-1.5	12/3/98 @ 1520	-1.7
March	07	Friday	1997	1416	-1.1	3/7/97 @ 1416	-1.1
April	03	Thursday	1997	1224	-0.5	4/8/97 @ 0440	-0.8
May	27	Tuesday	1997	0816	-0.3	5/7/97 @ 0431	-1.1
June	26	Thursday	1997	0841	0.2	6/5/97 @ 0423	-1.1
July	24	Thursday	1997	0715	0.1	7/21/97 @ 0504	-1.1
August	08	Friday	1997	0642	1.2	8/18/97 @ 0357	-0.9
September	15	Monday	1997	1451	0.7	9/15/97 @ 0248	-0.5
October	15	Wednesday	1997	1530	-0.4	10/16/97 @ 1616	-0.6
November	13	Thursday	1997	1424	-0.8	11/14/97 @ 1509	-1.1
December	11	Thursday	1997	1337	-0.7	12/14/97 @ 1544	-1.2

Responsible Staff: Pete Baranov

Data Collection: Monthly with monthly reporting.

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DOWNSTREAM SURFACE WATER SAMPLES

TABLE 3-2

DATE	TIME	SAMPLING LOCATION	TKN (mg/L)	NO3 (mg/L)	CHLOR."A" (ug/L)	TDS (mg/L)	Total P (mg/l)	TEMP (deg.C)	COMMENTS
3/7/97	1349	East of Edgemere Bridge	ND<1	ND<1*		2810			
3/7/97	1410	SWR Before Demin. Discharge	ND<1	ND<1*		2920			
3/7/97	1425	SWR & Upper P.C. Confluence	ND<1	ND<1*		5850			No flow from Paradise Creek drain.
4/3/97	1235	SWR Before Demin. Discharge	1.2	1.4*	ND<1	1500			
4/3/97	1225	SWR & Upper P.C. Confluence	1.2	1.7*	2.0	2510			No flow from Paradise Creek drain
4/3/97	1306	West of N.C. Blvd. Bridge	ND<1	ND<10*	6.0	31000			
4/3/97	1256	West of Trolley Bridge	ND<1	ND<10*	1.0	31000			
4/3/97	1359	24th Street Pier	ND<1	ND<10*	1.0	31400			
5/27/97	0835	SWR Before Demin. Discharge	ND<1	ND<0.10	ND<1	4550			
5/27/97	0855	SWR & Upper P.C. Confluence	ND<1	0.15	7.0	24000			No flow from Paradise Creek drain.
5/27/97	0915	West of N.C. Blvd. Bridge	ND<1	ND<0.10	ND<1	35300			
5/27/97	0930	West of Trolley Bridge	ND<1	ND<0.10	ND<1	34200			
5/27/97	0950	24th Street Pier	ND<1	ND<0.10	3.0	35200			
6/26/97	0905	SWR Before Demin. Discharge	ND<1	ND<0.10	2.0	27000		25	
6/26/97	0857	SWR & Upper P.C. Confluence	ND<1	ND<0.10	2.0	14100		21	No flow from Paradise Creek drain
6/26/97	0850	West of N.C. Blvd. Bridge	ND<1	ND<0.10	1.0	33600		24	
6/26/97	0834	West of Trolley Bridge	ND<1	ND<0.10	1.0	36100		24	
6/26/97	0823	24th Street Pier	ND<1	ND<0.10	1.0	34900		25	
7/24/97	0715	SWR Before Demin. Discharge	ND<1	ND<10*	1.0	32400			
7/24/97	0715	SWR & Upper P.C. Confluence	ND<1	ND<10*	2.0	32000			No flow from Paradise Creek drain
7/24/97	0715	West of N.C. Blvd. Bridge	ND<1	ND<10*	1.0	38100			
7/24/97	0715	West of Trolley Bridge	ND<1	ND<10*	8.0	32800			
7/24/97	0715	24th Street Pier	ND<1	ND<10*	1.0	34000			
8/8/97	0642	SWR Before Demin. Discharge	ND<1	ND<0.10	4.0	18900			
8/8/97	0642	SWR & Upper P.C. Confluence	ND<1	ND<0.10	ND<1	27000			No flow from Paradise Creek drain.
8/8/97	0642	West of N.C. Blvd. Bridge	ND<1	ND<0.10	1.0	34800			
8/8/97	0642	West of Trolley Bridge	ND<1	ND<0.10	2.0	33300			
8/8/97	0642	24th Street Pier	ND<1	ND<0.10	ND<1	35300			
9/15/97	1450	SWR Before Demin. Discharge	ND<1	ND<0.10	4.0	25300		26	
9/15/97	1440	SWR & Upper P.C. Confluence	ND<1	ND<0.10	10.0	14800		25	No flow from Paradise Creek drain
9/15/97	1425	West of N.C. Blvd. Bridge	ND<1	ND<0.10	2.0	32100		27	
9/15/97	1416	West of Trolley Bridge	ND<1	ND<0.10	1.0	34200		26	
9/15/97	1405	24th Street Pier	ND<1	ND<0.10	1.0	36300		26	
10/15/97	1525	SWR Before Demin. Discharge	ND<1	0.11	1.0	19500		26	
10/15/97	1515	SWR & Upper P.C. Confluence	ND<1	0.11	2.0	25600		25	No flow from Paradise Creek drain.
10/15/97	1500	West of N.C. Blvd. Bridge	ND<1	0.11	3.0	36700		27	
10/15/97	1447	West of Trolley Bridge	ND<1	ND<0.10	10.0	33400		26	
10/15/97	1430	24th Street Pier	ND<1	ND<0.10	7.0	35600		26	
11/12/97	1330	SWR Before Demin. Discharge	ND<1	ND<0.10	5.0	18000	0.19	19	
11/12/97	1315	SWR & Upper P.C. Confluence	ND<1	ND<0.10	7.0	23000	0.20	20	No flow from Paradise Creek drain.
11/12/97	1300	West of N.C. Blvd. Bridge	ND<1	ND<0.10	6.0	32000	0.09	20	
11/12/97	1250	West of Trolley Bridge	ND<1	0.10	3.0	32100	0.06	20	
11/12/97	1231	24th Street Pier	ND<1	ND<0.10	4.0	34100	0.02	19	

All Sample Points	TKN (mg/l)	NO_3 (mg/l)	CHLOR "A" (ug/l)	TDS (mg/l)
Average	0.06	0.10	5.60	22725
Maximum	1.2	1.8	49	36100
Minimum	0	0	0	600

Before Demin	TKN	NO_3	CHLOR A	TDS
Average	0.1	0.18	4.2	11821
Maximum	1.2	1.8	17.0	32400
Minimum	0.0	0	0.0	1100

Confluence	TKN	NO_3	CHLOR A	TDS
Average	0.08	0.10	5.0	13249
Maximum	1.2	0.41	14.0	32000
Minimum	0	0	0.0	600

W. NC Blvd	TKN	NO_3	CHLOR A	TDS
Average	0.08	0.11	7.1	29857
Maximum	1.1	1.2	49.0	36100
Minimum	0	0	0.0	12100

W. Trolley	TKN	NO_3	CHLOR A	TDS
Average	0	0.08	8.0	29943
Maximum	0	0.87	40.0	36100
Minimum	0	0	0.0	14300

24th St Pier	TKN	NO_3	CHLOR A	TDS
Average	0.08	0.05	3.8	31036
Maximum	1.1	0.56	9.3	36300
Minimum	0	0	0.0	20400

Responsible Staff: P. Baranov

Comment: Samples taken at or near low ebb tidal stage near a perigeon tide series.

* Detection Limits out of acceptable range. Data omitted from averages.

ND = Not D·

DATE	TIME	SAMPLING LOCATION	TKN (mg/L)	NO3 (mg/L)	CHLOR."A" (ug/L)	TDS (mg/L)	Total P (mg/l)	TEMP. (deg.C)	COMMENTS
12/11/97	1330	SWR Before Demin. Discharge	ND<1	ND<0.10	12.0	9900	0.13	14	
12/11/97	1315	SWR & Upper P.C. Confluence	ND<1	ND<0.10	4.0	8800	ND<0.010	14	No flow from Paradise Creek drain.
12/11/97	1305	West of N.C. Blvd. Bridge	ND<1	ND<0.10	5.0	28100	0.13	16	
12/11/97	1250	West of Trolley Bridge	ND<1	ND<0.10	1.0	33400	0.18	15	
12/11/97	1235	24th Street Pier	ND<1	ND<0.10	1.0	32200	0.06	15	
1/27/98	1535	SWR Before Demin. Discharge	ND<1	ND<0.10	5.0	5900	0.09	14	
1/27/98	1530	SWR & Upper P.C. Confluence	ND<1	0.18	5.0	7400	0.12	14	No flow from Paradise Creek drain.
1/27/98	1518	West of N.C. Blvd. Bridge	ND<1	ND<0.10	6.0	38100	0.10	16	
1/27/98	1513	West of Trolley Bridge	ND<1	ND<0.10	5.0	33200	0.08	15	
1/27/98	1500	24th Street Pier	ND<1	ND<0.10	5.0	34500	0.05	15	
2/25/98	1440	SWR Before Demin. Discharge	ND<1	1.80	3.4	1100	0.58	15	High flows from river.
2/25/98	1430	SWR & Upper P.C. Confluence	ND<1	0.41	6.6	600	0.16	17	High flows from river and Paradise drain.
2/25/98	1413	West of N.C. Blvd. Bridge	ND<1	1.20	7.7	12100	0.56	17	
2/25/98	1405	West of Trolley Bridge	ND<1	0.87	20.5	14300	0.37	18	
2/25/98	1343	24th Street Pier	ND<1	0.56	8.1	20400	0.33	17	
3/25/98	1330	SWR Before Demin. Discharge	ND<1	0.18	2.0	6200	0.17	17	
3/25/98	1320	SWR & Upper P.C. Confluence	ND<1	0.25	2.4	4960	0.16	16	No flow from Paradise Creek drain.
3/25/98	1305	West of N.C. Blvd. Bridge	ND<1	ND<0.10	5.6	23200	0.19	17	
3/25/98	1255	West of Trolley Bridge	ND<1	ND<0.10	12.2	27200	0.12	18	
3/25/98	1240	24th Street Pier	ND<1	ND<0.10	7.0	27100	0.10	18	
4/23/98	1350	SWR Before Demin. Discharge	ND<1	ND<0.10	2.5*	3180	0.13		*Contains large amounts of Phaeophytin
4/23/98	1340	SWR & Upper P.C. Confluence	ND<1	ND<0.10	5.4	5960	0.15		No flow from Paradise Creek drain.
4/23/98	1330	West of N.C. Blvd. Bridge	ND<1	ND<0.10	5.9	21900	0.16		
4/23/98	1315	West of Trolley Bridge	ND<1	ND<0.10	6.9	23900	0.79		
4/23/98	1300	24th Street Pier	ND<1	ND<0.10	4.5	28200	0.06		
5/18/98	0950	SWR Before Demin. Discharge	ND<1	0.11	17.0	1860	0.09	19	
5/18/98	0940	SWR & Upper P.C. Confluence	ND<1	0.13	14.0	2160	0.09	19	No flow from Paradise Creek drain.
5/18/98	0930	West of N.C. Blvd. Bridge	1.1	ND<0.10	49.0	21000	0.09	23	
5/18/98	0919	West of Trolley Bridge	ND<1	ND<0.10	40.0	20100	0.09	21	
5/18/98	0855	24th Street Pier	1.1	ND<0.10	9.3	23700	0.02	21	
6/15/98	0846	SWR Before Demin. Discharge							
6/15/98	0837	SWR & Upper P.C. Confluence							No flow from Paradise Creek drain.
6/15/98	0827	West of N.C. Blvd. Bridge							
6/15/98	0817	West of Trolley Bridge							
6/15/98	0800	24th Street Pier							
6/15/98		Paradise Creek @ NC Golf Course							No Flow.

Responsible Staff: P. Baranov

Comment: Samples taken at or near low ebb tidal stage near a perigeon tide series.

* Detection Limits out of acceptable range. Data omitted from averages.

ND = Not Detected

3.2 Eelgrass

A. Task. Measure the specific distribution of eelgrass within and adjacent to the mouth of the Sweetwater River channel as shown on **Figure 3-1 and 3-2.** A profile of eelgrass compensation depths as a function of distance from the interior portion of the Sweetwater channel will be developed.

B. Purpose. To determine if concentrate disposal has caused change in eelgrass.

C. Time Frame. Monitoring transects commencing July 1997 and continuing on a monthly basis for the months of August, September and October. Additional monitoring will occur in January and April. Monitoring will continue for three years after the plant begins operating. At that time, all involved parties will meet to determine whether additional monitoring and/or revisions to the monitoring program will be required.

D. Methodology. Specific methodology will be discussed with the National Marine Fisheries. Summary of findings is reported on **Table 3-3.** The Eelgrass survey report is attached as Appendix G.

E. Staff Responsible. Environmental Coordinator (T. Murphree) will coordinate with consultant on eelgrass monitoring.

SWEETWATER AUTHORITY

LEGEND

- San Diego Bay Perime' Ecological Study Grid
- Eelgrass Bed (25% cover)
- Eelgrass Bed (50% cover)

N

50 0 50 100 150 200 250 300 350 Feet

Distribution of Eelgrass Beds at the Mouth of the Sweetwater River

Figure 3-2

Image and data source: U.S. Naval Facilities Engineering Command, Natural Resources Branch (1996)

eelgrass.ai/.GS

Table 3-3
Summary of Eelgrass Distribution

Date	Surveyed by	Area of Coverage (ft^2)	Mean Depth (feet MLLW)	Shoot Density (shoots/m^2)
6/23/97	H. Hanson, K. Cull	20,315	-2.2 ± 0.4 (n=12)	125.8 ± 50.6 (n=12)
8/13/97	H. Hanson, K. Cull	20,250	-2.2 ± 0.4 (n=12)	193.3 ± 54.8 (n=12)
10/28/97	H. Hanson, K. Cull	12,993	-1.9 ± 0.4 (n=10)	139.2 ± 46.5 (n=12)
2/13/98	H. Hanson, R. Woodfield	11,563	-1.9 ± 0.4 (n=9)	129.8 ± 46.3 (n=9)
4/27/98	K. Cull, A. Gutierrez	11,910	-0.9 ± 0.5 (n=10)	129.6 ± 39.5 (n=10)
6/24/98	H. Hanson, R. Woodfield	13,450	-1.55 ± 0.9 (n=10)	270.4 ± 86.1 (n=10)

3.3 Macroalgae

A. Task. Measure the macroalgae abundance and distribution in the areas identified in Figure 3-1. Macroalgae attaches to surfaces ranging from hard scape to mudflats. When extremely abundant, macroalgae can smother or inhibit recruitment of some vascular plant species in tidal salt marshes. The primary indicator of Macroalgae abundance is a real extent of cover. Because direct measurement of cover requires intrusion into and disturbance of mudflat and salt marsh areas, less destructive sampling efforts are planned.

Monitoring will occur along the entire reach of potential nutrient influence. At each sampling location, three non-overlapping photographic "sample sites" shall be taken.

B. Purpose. To determine if concentrate disposal has caused changes in macroalgae abundance.

C. Time Frame. Same as that identified in Section 3.1.C.

D. Methodology. Estimated percent cover measured using aerial photographs and grid overlays. Summary of findings are reported on **Table 3-4** and **Figure 3-5.** The Macroalgae survey report is attached in Appendix G.

Photographs will be taken of mudflat areas from standardized locations at each sampling site. Photographs will be taken at or near +1 foot MLLW tidal elevation and, to the extent practical, at the same time of day. Photographs shall be taken at a consistent height and using a standard lens size. These photographs will be overlain with a standard grid to estimate percent cover (e.g., percentage of boxes in grid containing algae). Photographs and percent cover for each site will be compared between sampling dates.

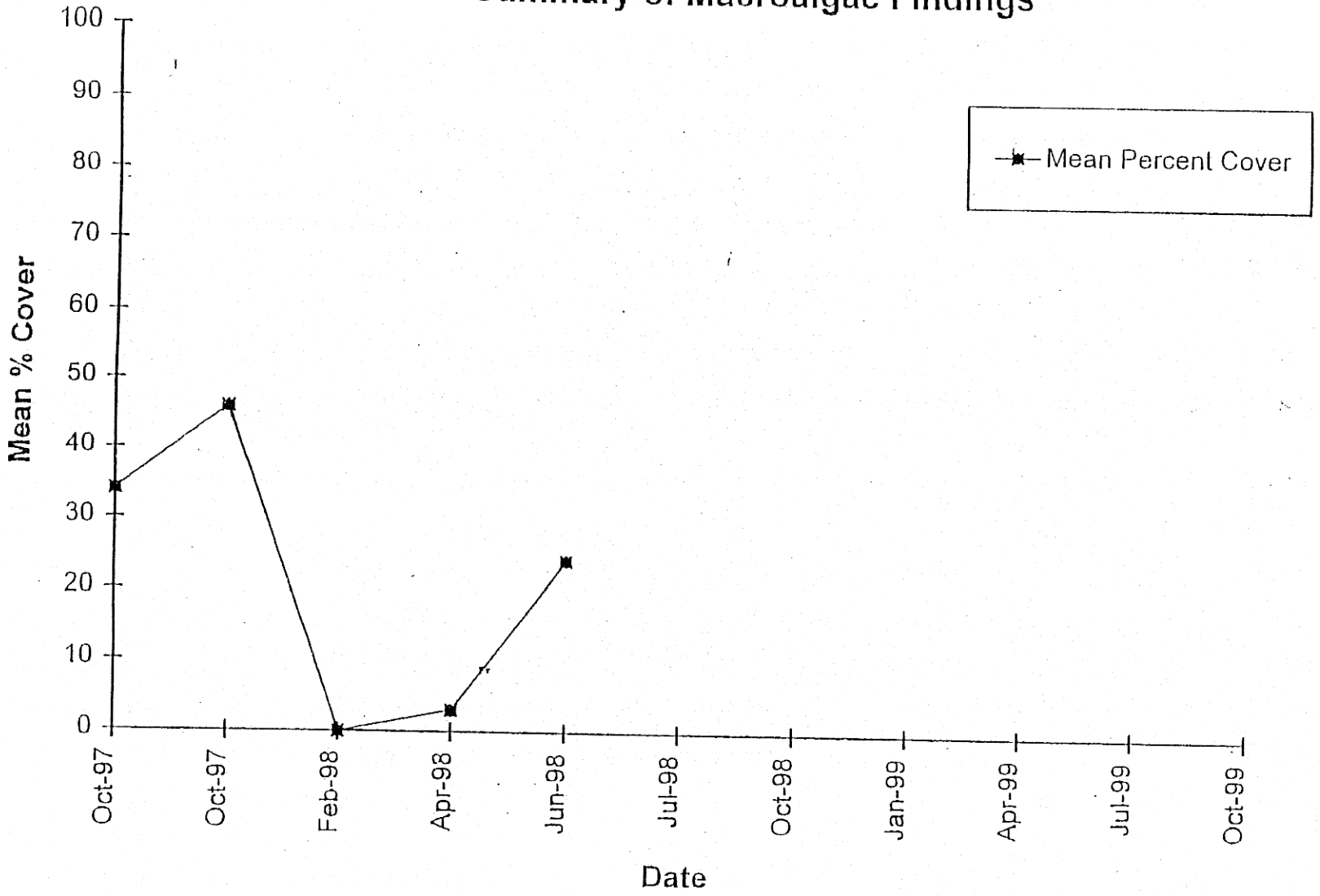
From each sampling location, the percent cover in each of the three sample photographs shall be averaged to estimate the mean percent cover at that location on that date. Mean percent cover at each location shall be compared to discern patterns, if any, relative to nutrient distribution. In addition, mean cover at each site will be compared over time to determine if there are any significant increases in Macroalgae cover potentially caused by the project.

E. Staff Responsible. Engineering Department, Environmental Coordinator (T. Murphree).

Table 3-4
Summary of Macroalgae Findings

Date	Surveyed by	Mean Coverage	Mean Wet Weight (g)
10/8/97	R. Woodfield, C. Moore	34%	192
10/28/97	H. Hanson, C. Cull	46%	403
2/13/98	H. Hanson, R. Woodfield	0%	0
4/22/98	H. Hanson, A. Gutierrez	3%	34
6/24/98	H. Hanson, R. Woodfield	24%	607

Figure 3-3
Summary of Macroalgae Findings



3.4 Seasonal Nitrogen Mass Loading Model

A. Task. Develop a seasonal nitrogen mass loading model for the Lower Sweetwater River downstream of the discharge point of the plant. From this model, distribution of sampling locations, intervals and effort (Section 3.1) shall be re-evaluated and protocols adjusted to allow the best degree of segregation of inputs as would be practical during operational phases.

B. Purpose. To determine if concentrate disposal has resulted in an increase in nitrate loading to lower Sweetwater River. This is in conjunction with monitoring of eelgrass and macroalgae (Sections 3.2 and 3.3 respectively).

C. Time Frame. Initial model shall be completed after receiving one year of baseline information per Sections 3.1, 3.2 and 3.3. Model will be continually updated as water sampling data is developed. Three years after commencement of project operation, all involved parties will meet to determine whether additional monitoring and/or revision to the monitoring program will be required.

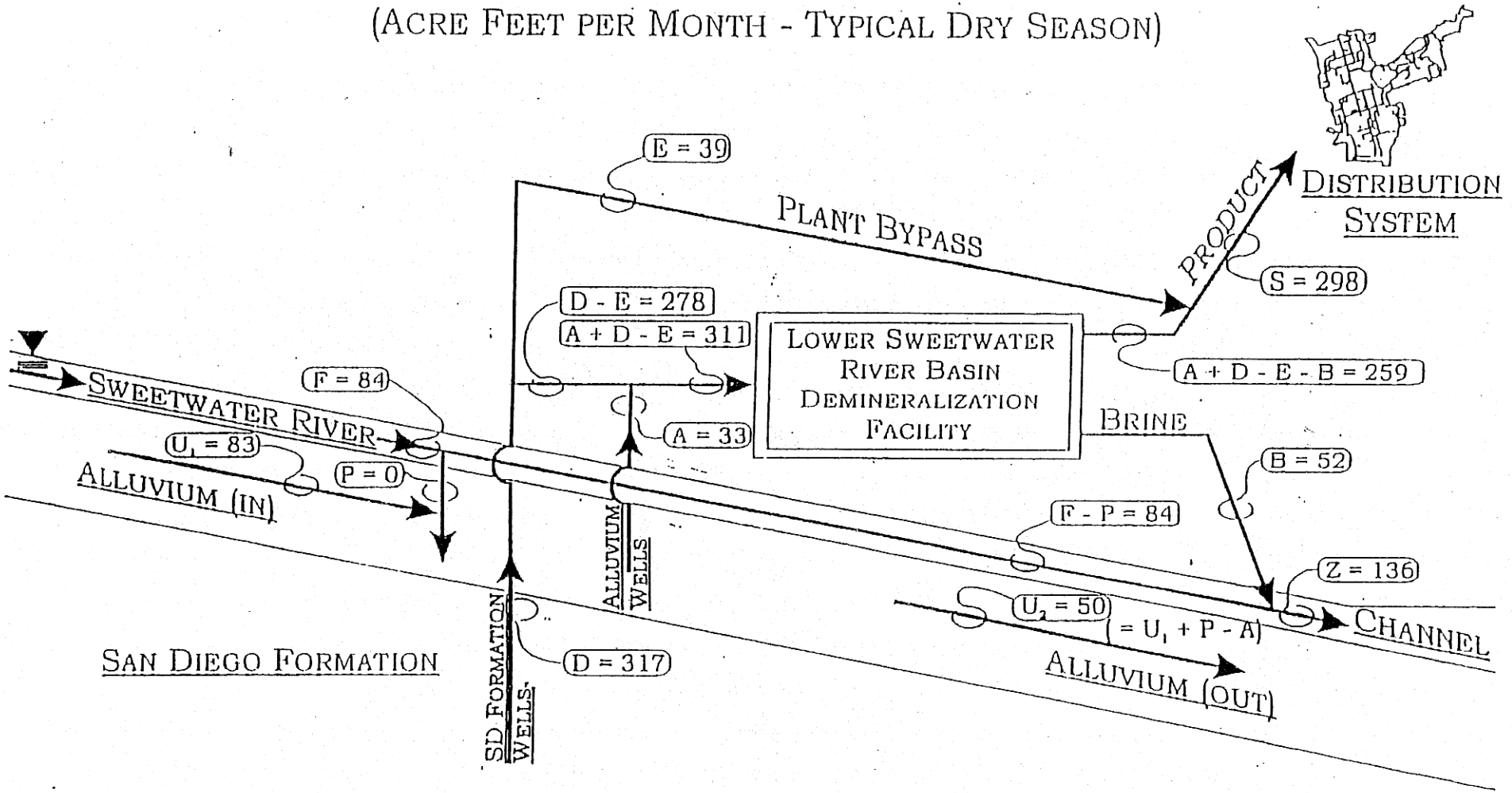
D. Methodology. Summary of model is shown on **Figure 3-4**, with summary of data reported on **Table 3-5.**

E. Staff Responsible. Water Quality Department (Dennis Bostad). Plant operator after plant is in operation.

FIGURE 3-4

DEMINERALIZATION FACILITY PLANT VOLUME BALANCE - EXAMPLE

(ACRE FEET PER MONTH - TYPICAL DRY SEASON)



Balances - Volume , AF/Mo

Brine : B = D + A - S => 317 + 33 - 298 = 52

River + Brine: Z = F - P + B => 84 - 0 + 52 = 136

Z = F + D + U1 -U2 -S => 84 + 317 + 83 - 50 - 298 = 136

Mass Balances - Kg / Mo TDS & N

TDS (10^3 Kg/Mo): 580 = 207 + 458 + 250 -151 -185

N (Kg/Mo): 352 = 208 + 78 + 307 - 185 - 56

Table 3-5
Report of Nitrogen Mass Loading Model

Date	Time	Nitrogen Mass Loading	Comments

Responsible Staff: Water Quality Department, Dennis Bostad
Data due: Annual report in December

Section 5
Summary of Monitoring Program in Demineralization Facility Production Adjustment

5.1 Objective

The objective of the monitoring program is to obtain ongoing feedback to ensure that the project is operated in a manner that will not adverseiy affect biological resources. After three years of post-construction monitoring, all involved parties will meet to determine whether additional monitoring and/or revisions to the monitoring program will be required.

5.2 General

The project has been designed with the flexibility to extract water from two independent water sources: the Lower Sweetwater River Basin Alluvium and the San Diego Formation. The relative water extraction volumes will vary seasonally. The information received from upstream and downstream monitoring and the San Diego Formation wells is needed in order to make the appropriate adjustments to water production at the plant, as well rates or groundwater extraction. One San Diego Formation well will always be in operation to provide raw water to blend with the permeate from the reverse osmosis units. This blending is required to reduce the corrosive qualities of the permeate.

Receipt and analyses of the data is essential to maximize the output of product water from the plant and avoiding impacts to the biological environment. By having the "baseline" data (i.e., one year of information before project starts), and then comparing the baseline data to the data after the commencement of the project necessary adjustments can be made. The following groundwater management scenarios would be used as appropriate:

1. The relative contribution from each source would vary in response to monitoring data. For example, when monitoring data indicates a marked drop in groundwater and reduced soil moisture that predicts an impact to the riparian vegetation, the alluvial pumping rate would be reduced or stopped until the threat of impact is no longer present.

2. Groundwater withdrawals could be limited to the night time hours when the evapotranspiration requirements of the habitat are much less. This scenario would be possible because of the quick recovery of the aquifer after cessation of pumping.

3. Whenever reduced pumping of the alluvial aquifer becomes necessary, additional pumping from the San Diego Formation could offset the reduction from the alluvial aquifer.

4. Groundwater extraction from the alluvial basin will be greatest during the winter months (December through March) due to higher probability of wet weather. The San Diego Formation extraction will be greatest during summer with least extraction during the winter months.

5.3 **Monitoring Impact Analysis**

The decision to adjust pumping from the groundwater aquifer will take a tiered approach. Combining all of the data and developing correlations is essential to base any identified impacts. Flow charts reflecting the tiered analysis for both upstream and downstream monitoring are shown on **Figures 5-1 and** 5-2, respectively.

Per October 1997 meeting with HM, JLS and DB will develop a monitoring plan for the operator.

5.4 **Time Frame**. As information is collected.

5.5 **Responsibility**. Operator of the Demineralization Plant and Water Quality.

FIGURE 5-1
UPSTREAM IMPACT ANALYSIS

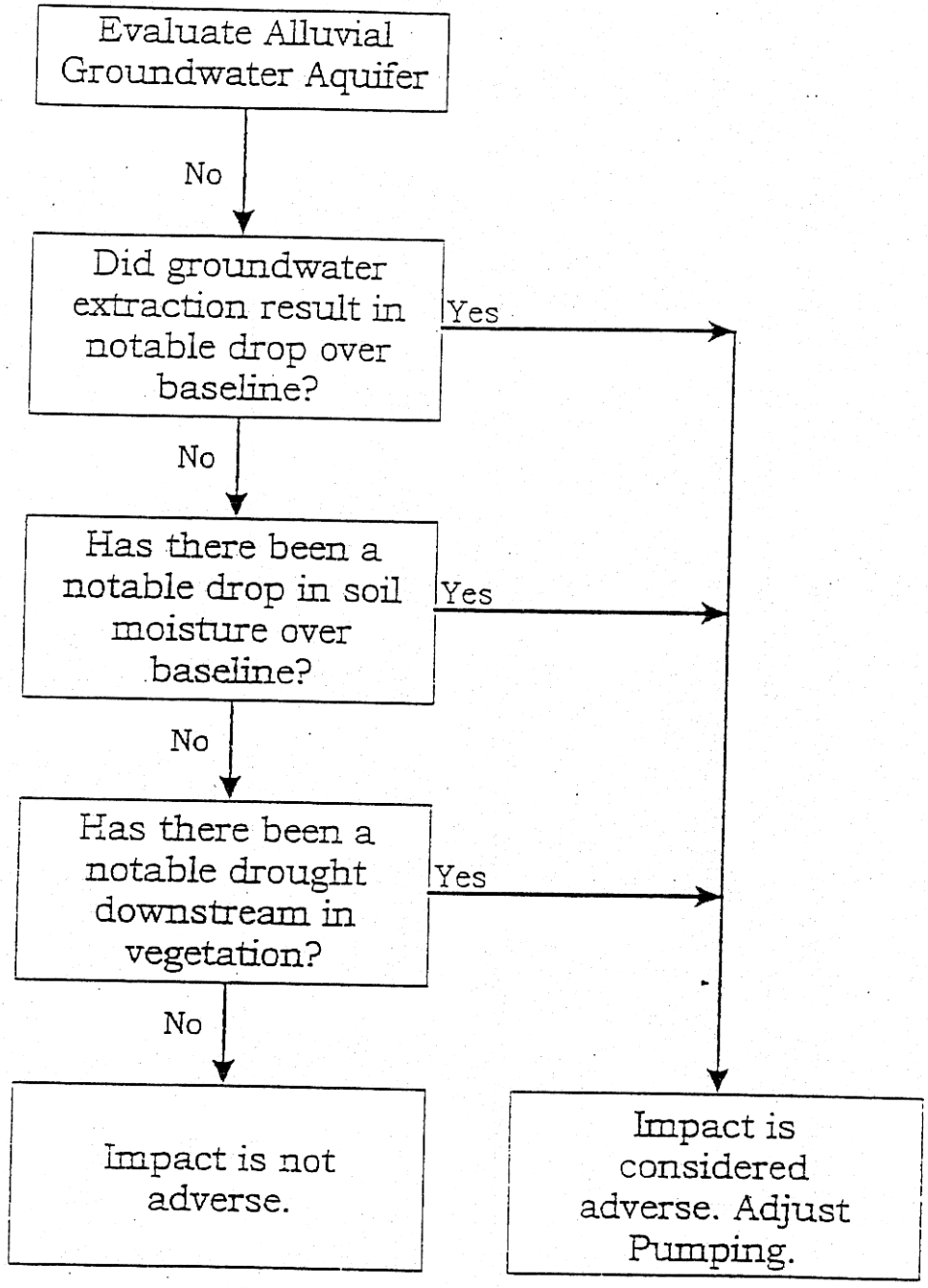


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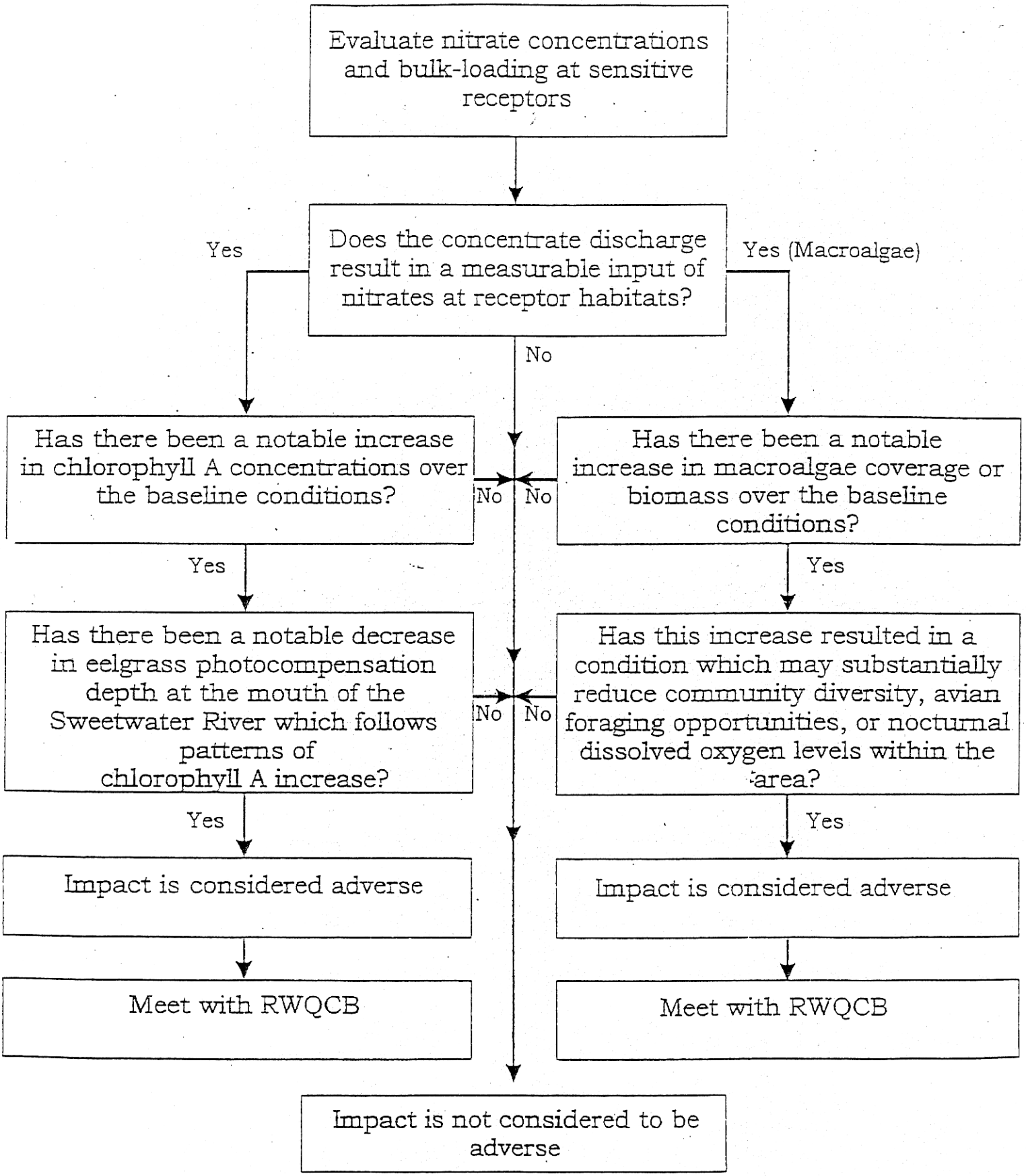
FIGURE 5-2
DOWNSTREAM IMPACT ANALYSIS



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Section 6
Reporting to Resource Agencies

6.1 Bureau of Reclamation

Unless otherwise directed, an annual report will be developed. The first report will summarize baseline information. Subsequent annual reports will be completed after plant begins operation. Reports will include summaries of all monitoring, action taken, and plant production adjustments (groundwater extraction and concentrate discharge). These reports will be submitted to the Bureau of Reclamation for review. The Bureau of Reclamation will provide the report to USFWS for review and comment.

The Sweetwater Authority Engineering Department will compile all of the data and develop the report.

6.2 Regional Water Quality Control Board

Downstream monitoring reports will be submitted quarterly. If nitrate levels are determined to be deleterious, the Authority will meet with the Board to consider alternative action for nitrate removal.

6.3 All Involved Agencies

U.S. Bureau of Reclamation
U.S. Fish and Wildlife Service
National Marine Fisheries Service
Regional Water Quality Control Board
California Department of Fish and Game

After three years of post-operational monitoring is completed, all involved agencies will meet to review monitoring data and analyses. At that time, a determination will be made as to whether additional monitoring and/or revisions to the monitoring program will be required.

An initial agency meeting was to be held in July 1998. However, the date that the demineralization facility will go online has been delayed until January or February 1999. As such, the pre-operational monitoring will continue through November 1998 and an agency meeting is proposed to be conducted at that time.